

WHAT IS CLAIMED IS

1. A process for producing a hydrogen absorbing alloy powder which is an aggregate of alloy particles each comprising a metal matrix and added-components, by conducting one of mechanical alloying and mechanical grinding, using an aggregate of metal matrix particles and an aggregate of added-component particles, wherein the relationship between the particle size  $D$  of the metal matrix particles and the particle size  $d$  of the added-component particles is set at  $d \leq D/6$ .
2. A process for producing a hydrogen absorbing alloy powder according to claim 1, wherein said metal matrix particles have the particle size  $D$  equal to or larger than  $3 \mu\text{m}$ , and the added-component particles have the particle size  $d$  equal to or smaller than  $500 \text{ nm}$ .
3. A process for producing a hydrogen absorbing alloy powder according to claim 1 or 2, wherein said metal matrix particles are Mg particles, and said added-component particles are at least one type selected from the group consisting of Ni particles, Ni alloy particles, Fe particles, Fe alloy particles, V particles, V alloy particles, Mn particles, Mn alloy particles, Ti particles, Ti alloy particles, Cu particles, Cu alloy particles, Al particles, Al alloy particles, Pd particles, Pd alloy particles, Pt particles, Pt alloy particles, Zr particles, Zr alloy

particles, Au particles, Au alloy particles, Ag particles, Ag alloy particles, Co particles, Co alloy particles, Mo particles, Mo alloy particles, Nb particles, Nb alloy particles, Cr particles, Cr alloy particles, Zn particles, Zn alloy particles, Ru particles, Ru alloy particles, Rh particles, Rh alloy particles, Ta particles, Ta alloy particles, Ir particles, Ir alloy particles, W particles and W alloy particles.

4. A hydrogen absorbing alloy powder which is an aggregate of alloy particles each including an Mg matrix and a plurality of ultra-fine particles dispersed in said Mg matrix, said Mg matrix including a plurality of Mg crystals having a grain size  $D_c$  of 1.0  $\mu\text{m}$  or more and 500  $\mu\text{m}$  or less, and said ultra-fine particles having a particle size  $d_0$  of  $10 \text{ nm} \leq d_0 \leq 500 \text{ nm}$ , said ultra-fine particles being at least one type selected from the group consisting of Ni ultra-fine particles, Ni alloy ultra-fine particles, Fe ultra-fine particles, Fe alloy ultra-fine particles, V ultra-fine particles, Va alloy ultra-fine particles, Mn ultra-fine particles, Mn alloy ultra-fine particles, Ti ultra-fine particles, Ti alloy ultra-fine particles, Cu ultra-fine particles, Cu alloy ultra-fine particles, Al ultra-fine particles, Al alloy ultra-fine particles, Pd ultra-fine particles, Pd alloy ultra-fine particles, Pt ultra-fine particles, Pt alloy ultra-fine particles, Zr ultra-fine particles, Zr alloy ultra-fine particles, Au

ultra-fine particles, Au alloy ultra-fine particles, Ag ultra-fine particles, Ag alloy ultra-fine particles, Co ultra-fine particles, Co alloy ultra-fine particles, Mo ultra-fine particles, Mo alloy ultra-fine particles, Nb ultra-fine particles, Nb alloy ultra-fine particles, Cr ultra-fine particles, Cr alloy ultra-fine particles, Zn ultra-fine particles, Zn alloy ultra-fine particles, Ru ultra-fine particles, Ru alloy ultra-fine particles, Rh ultra-fine particles, Rh alloy ultra-fine particles, Ta ultra-fine particles, Ta alloy ultra-fine particles, Ir ultra-fine particles, Ir alloy ultra-fine particles, W ultra-fine particles and W alloy ultra-fine particles.

5. A hydrogen absorbing alloy powder according to claim 4, wherein the particle size  $d_0$  of said ultra-fine particles is equal to or larger than 100 nm.

6. A hydrogen absorbing alloy powder according to claim 4 or 5, wherein the content  $G_p$  of said ultra-fine particles is in a range of 0.1 % by atom  $\leq G_p \leq$  5.0 % by atom.

7. A hydrogen absorbing alloy powder according to claim 4 or 5, wherein the content  $G_p$  of said ultra-fine particles is in a range of 0.3 % by atom  $\leq G_p \leq$  3.0 % by atom.

8. A hydrogen absorbing alloy powder according to claim 6, wherein said ultra-fine particles comprise a plurality of Ni ultra-fine particles and a plurality of Fe ultra-fine particles.

9. A hydrogen absorbing alloy powder which is an aggregate of alloy particles each including a Ti-Fe alloy matrix and a plurality of ultra-fine particles dispersed in said Ti-Fe alloy matrix, said Ti-Fe alloy matrix including a plurality of Ti-Fe alloy crystals having a grain size  $D_c$  in a range of  $1.0 \mu\text{m} \leq D_c \leq 500 \mu\text{m}$ , said ultra-fine particles having a particle size  $d_0$  in a range of  $10 \text{ nm} \leq d_0 \leq 500 \text{ nm}$ , said ultra-fine particles being at least one type selected from the group consisting of Ni ultra-fine particles, Ni alloy ultra-fine particles, Fe ultra-fine particles, Fe alloy ultra-fine particles, V ultra-fine particles, V alloy ultra-fine particles, Mn ultra-fine particles, Mn alloy ultra-fine particles, Ti ultra-fine particles, Ti alloy ultra-fine particles, Cu ultra-fine particles, Cu alloy ultra-fine particles, Al ultra-fine particles, Al alloy ultra-fine particles, Pd ultra-fine particles, Pd alloy ultra-fine particles, Pt ultra-fine particles, Pt alloy ultra-fine particles, Zr ultra-fine particles, Zr alloy ultra-fine particles, Au ultra-fine particles, Au alloy ultra-fine particles, Ag ultra-fine particles, Ag alloy ultra-fine particles, Co ultra-fine particles, Co alloy ultra-fine particles, Mo

ultra-fine particles, Mo alloy ultra-fine particles, Nb ultra-fine particles, Nb alloy ultra-fine particles, Cr ultra-fine particles, Cr alloy ultra-fine particles, Zn ultra-fine particles, Zn alloy ultra-fine particles, Ru ultra-fine particles, Ru alloy ultra-fine particles, Rh ultra-fine particles, Rh alloy ultra-fine particles, Ta ultra-fine particles, Ta alloy ultra-fine particles, Ir ultra-fine particles, Ir alloy ultra-fine particles, W ultra-fine particles and W alloy ultra-fine particles.

10. A hydrogen absorbing alloy powder according to claim 9, wherein the particle size  $d_0$  of said ultra-fine particles is equal to or larger than 100 nm.

11. A hydrogen absorbing alloy powder according to claim 9 or 10, wherein the content  $G_p$  of said ultra-fine particles is in a range of 0.1 % by atom  $\leq G_p \leq$  5.0 % by atom.

12. A hydrogen absorbing alloy powder according to claim 9 or 10, wherein the content  $G_p$  of said ultra-fine particles is in a range of 0.3 % by atom  $\leq G_p \leq$  3.0 % by atom.

13. A hydrogen storing tank for mounting in a vehicle and including a hydrogen absorbing alloy powder therein, said hydrogen absorbing alloy powder being an aggregate of alloy

particles each including an Mg matrix and a plurality of ultra-fine particles dispersed in said Mg matrix, said Mg matrix including a plurality of Mg alloy crystals having a grain size  $D_c$  in a range of  $1.0 \mu\text{m} \leq D_c \leq 500 \mu\text{m}$ , and said ultra-fine particles having a particle size  $d_0$  in a range of  $10 \text{ nm} \leq d_0 \leq 500 \text{ nm}$ , said ultra-fine particles being at least one type selected from the group consisting of Ni ultra-fine particles, Ni alloy ultra-fine particles, Fe ultra-fine particles, Fe alloy ultra-fine particles, Vulloy ultra-fine particles, Valloy ultra-fine particles, Mn ultra-fine particles, Mn alloy ultra-fine particles, Ti ultra-fine particles, Ti alloy ultra-fine particles, Cu ultra-fine particles, Cu alloy ultra-fine particles, Al ultra-fine particles, Al alloy ultra-fine particles, Pd ultra-fine particles, Pd alloy ultra-fine particles, Pt ultra-fine particles, Pt alloy ultra-fine particles, Zr ultra-fine particles, Zr alloy ultra-fine particles, Au ultra-fine particles, Au alloy ultra-fine particles, Ag ultra-fine particles, Ag alloy ultra-fine particles, Co ultra-fine particles, Co alloy ultra-fine particles, Mo ultra-fine particles, Mo alloy ultra-fine particles, Nb ultra-fine particles, Nb alloy ultra-fine particles, Cr ultra-fine particles, Cr alloy ultra-fine particles, Zn ultra-fine particles, Zn alloy ultra-fine particles, Ru ultra-fine particles, Ru alloy ultra-fine particles, Rh ultra-fine particles, Rh alloy ultra-fine particles,

particles, Ta ultra-fine particles, Ta alloy ultra-fine particles, Ir ultra-fine particles, Ir alloy ultra-fine particles, W ultra-fine particles and W alloy ultra-fine particles.